

# THE METHOD OF PUTTING NUCLEON PICK-UP AND STRIPPING EXPERIMENTS DATA IN ACCORDANCE TO EACH OTHER

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It is known that nuclear state spectroscopic factors extracted from nucleon pick-up and stripping reactions data are characterized by large degree of systematic uncertainty. It takes place because of significant uncertainties in absolute normalization of spectroscopic factors and besides because of ignorance of some  $j$  values of the total transferred moments. As a result absolute values of the spectroscopic factors obtained in various experiments can differ by factor 2 and more.

The method of spectroscopic factors evaluation with taking into account systematical disagreements mentioned was developed. The main idea is to correct the experimental pick-up and stripping reaction data in order to satisfy three conditions: - strong sum rules would fill out for 3 single-particle orbits closest to Fermi energy, experimental data for which are presented with maximum of completeness; - non-strong sum rules would fill out for the rest orbits; - total number of the nucleons for the all orbits should be conserved.

To achieve this aim several freedom degrees are used: new normalization for experimental data is introduced  $S+nlj(Ex) \rightarrow (n+)(S+nlj(Ex))$ ,  $S-nlj(Ex) \rightarrow (n-)(S-nlj(Ex))$ ; all known information on spin of the final states is used, and all possibilities are investigated for states with unknown spins. The computer codes ARES were developed on the base of the described procedures.

As a result, more realistic spectroscopic factors allow avoiding of discrepancies between pick-up and stripping experimental data. Nucleon occupation probabilities of single-particle orbits and single-particle energies are determined on the base of improved spectroscopic factors.

Nucleon occupation probabilities and single-particle energies of single-particle orbits were determined on the base of improved spectroscopic factors for <sup>40,42,44,46,48</sup>Ca, <sup>46,48,50</sup>Ti, <sup>50,52,54</sup>Cr, <sup>54,56,58</sup>Fe, <sup>58,60,62,64</sup>Ni, <sup>64,66,68,70</sup>Zn, <sup>90,92,94,96</sup>Zr, <sup>116,118,120</sup>Sn both for neutron and proton orbits /1, 2/. Many essential results were obtained, some new phenomena were found-out /3, 4/.

President of Russia grant N SS-1619.2003.2 and RBFR grant N 03-07-90431.

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